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ERTS Contracting Officer
Code 245, GSFC
Greenbelt, Maryland 20771

Subject: Type I Progress Report for ERTS-1

Period Covered: May and June, 1973

EarthSat Project No: G-074

A. Title: Investigation to Develop a Multistage Forest Sampling
Inventory System Using ERTS-1 Imagery. PR-126

B. Principal Investigator: Philip G. Langley
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C. Problems Impeding Investigation:

None at present. We have recently received the first images
for 1973 and have ordered color composites and digital tapes.

D. Accomplishments:

1. This period

As outlined in the previous reports, our research effort
continues in two areas, namely (1) manual photo interpretation of the
sample units as annotated on the ERTS images, and (2) digital
interpretation of these sample units.

Manual Interpretation

Since the last reporting period we have completed 70 percent of
the interpretation of the U-2 and ERTS images for the purpose of timber
volume predictions within the Northern California test site.

Photo interpretation regarding the primary sample units was begun
with the U-2 high altitude imagery. Recent forest inventory data were
used as an aid to assign timber volume estimates to portions of primary
sample units for which previous timber volume data were not available.

N73-26348

E73-10743) INVESTIGATION TO DEVELOP A
MULTISTAGE FOREST SAMPLING INVENTORY
SYSTEM USING ERTS-1 IMAGERY Progress
Report, May - (Earth Satellite Corp.,
Berkeley, Calif.) 4 p HC \$3.00 CSCL 02F

Unclas
G3/13 00743

A list of timber volumes per primary sample unit is being prepared during this phase of the project and will be used subsequently as a data base for statistical analysis and digital interpretation of the sample units.

Digital Interpretation

In the previous Type I report we stated that the image handling system had been completed, and that we had started on the feature extraction program and the unsupervised classification program. To date, the latter two systems are functional and we are presently setting up a series of tests to evaluate their usefulness in the forest inventory framework.

In addition to these two major programs, we have developed some auxiliary programs. One will display classification outputs by means of a Calcomp plotter and another will enable us to calculate class areas by sample units.

Summarizing, we can state that at the end of this reporting period our major effort in program development has come to a close, and that we are now beginning to concentrate on the practical evaluation of the systems.

2. Plans for Next Period:

Manual Interpretation

During this period the interpretation of the ERTS-1 images for estimating timber volumes will be completed. Regression analysis will be performed on the data to determine the most significant contributing variables for estimating volumes.

In addition, we hope to determine how closely related timber estimates made from ERTS are to timber estimates made by more conventional means of timber inventory.

Manual interpretation techniques will be used for comparison and evaluation of computer generated volume estimates from the ERTS digital data tapes.

Digital Interpretation

The ultimate goal for the unsupervised classifier which we have developed is not to identify land-use categories as is usually the case with digital interpretation systems, but to identify land categories that will be significantly correlated with timber volume.

To test the feasibility of such a classification system we will perform a series of experiments. In these experiments we will perform regressions, with as dependent variables the timber volumes of sample units in a test area, and as independent variables the areas for each sample unit occupied by a certain class, as indicated by the classifier. The variables to be estimated will be the volume levels associated with each class. For each experiment we will vary some basic interpretation parameters.

For the test areas we will use two areas in steep mountainous terrain with four primary sample units each. Each of these primary sample units will be divided into 16 square mile sections, so that we will have 64 sections for each test area. For each of these sections we have a timber volume estimate obtained from previous surveys, or ocularly estimated by an experienced photo interpreter using the U-2 photographs.

We will attempt to vary all major parameters to the digital interpretation process, in the hope of producing a digital classification which will be significantly correlated to the known volume levels.

E. Significant Results:

No significant results beyond those described in our previous Type II report have been obtained in this reporting period. We have been engaged in the development of component parts of our digital interpretation system, which is presently functional and in the testing stage.

F. Publications:

No publications were released during this period.

G. Recommended Changes:

No major changes in procedures are recommended at this time.

H. Changes in Standing Order Forms:

None required.

I. ERTS Image Descriptor Forms:

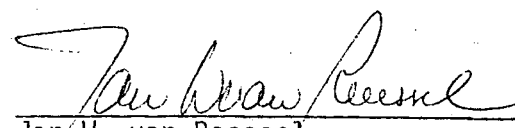
No image descriptor forms are enclosed.

J. Data Request Forms:

Two new data request forms were submitted for digital tapes and color composites of two new scenes acquired in April of this year.

Submitted for Philip G. Langley
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PR-126

By


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